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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/720,372	03/09/2001	Kenji Kubomura	KUBOMURA-1	2532

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EXAMINER	
PIERCE, JEREMY R	

ART UNIT	PAPER NUMBER
1771	

DATE MAILED: 11/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/720,372	KUBOMURA ET AL.	
	Examiner	Art Unit	
	Jeremy R. Pierce	1771	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 September 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,7,21-23 and 28-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7,21-23 and 28-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on September 5, 2003 has been entered. Claims 24-27 have been cancelled. Claims 1, 4, and 7 have been amended. Claims 31 and 32 have been added. Claims 1-4, 7, 21-23, and 28-32 are currently pending.

Claim Objections

2. Claim 23 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 23 recites "different sheets of reinforcing fibers have different coefficients of linear expansion." But the limitation of the sheets having different coefficients of linear expansion is already present in claim 4.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-4, 7, and 21-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims recite a "composite material having a reduced or low coefficient of linear expansion." Applicant argues that the fiber reinforced composite material has a reduced or low coefficient of thermal expansion regardless of what it is compared to

among such composites in the prior art. This argument provides little clarity as to what a reduced or low coefficient of linear expansion is. There is no uniform standard or consensus in the prior art of what the coefficient of linear expansion is. There is likely a broad range of coefficients of thermal expansion used in the art. Applicant is saying that no matter what prior art the claim is compared to, it has a reduced coefficient of linear expansion. This does not define definite boundaries for the claim. The prior art has already set forth reducing the coefficient of linear expansion (see Miyadera et al.). Applicant cannot define novelty in an invention by simply stating that it is better than whatever it is compared to.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3, 7, and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyadera et al. (U.S. Patent No. 4,446,191).

Miyadera et al. teach a heat resistant laminate with a low expansion coefficient (column 1, lines 5-7). The laminate is made from composite fabrics comprising 30-95% by weight of aromatic polyamide and 5-70% by weight of glass fibers (column 1, lines 41-47). The glass fibers have a positive coefficient of thermal expansion, but the aromatic polyamide fibers control the thermal expansion of the composite because they have a negative coefficient of thermal expansion. The composite fabric may be woven

(column 1, line 64). The weave may be made from alternating one by one aromatic polyamide fiber and glass fiber (column 2, lines 4-7). Also, the weave may be formed from twisting fibers of aromatic polyamide and glass together into a yarn, then weaving the yarn (column 2, lines 8-27). The composite fabrics are then impregnated with a resin (column 3, lines 31-36), and optionally made into a prepreg by incorporating hardener with the resin (column 3, lines 42-45). With regard to claim 31, the limitation that the composite material is fully balanced is not limiting the claim any further because the claim does not recite what the composite is being balanced to. Applicant recites in the specification that the coefficient can be controlled to zero or any predetermined value (page 7). The composite of Miyadera et al. must be balanced to some predetermined value.

7. Claims 1, 2, 4, 21, 23, 31, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Kashima et al. (U.S. Patent No. 5,462,791).

Kashima et al. disclose a laminate of fabrics composed of glass fibers and/or polyethylene fibers (column 7, lines 14-64). Each fabric layer may be composed of the same material, alternating the positive coefficient fibers with the negative coefficient fibers, or each fabric may be composed of two different fibers. The fabric layers are then impregnated with an epoxy resin. With regard to claims 31 and 32, the limitation that the composite material is fully balanced is not limiting the claim any further because the claim does not recite what the composite is being balanced to. Applicant recites in the specification that the coefficient can be controlled to zero or any predetermined

value (page 7). The composite of Kashima et al. must be balanced to some predetermined value.

8. Claims 1, 2, 4, 21, 23, 28, and 30-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Leibowitz (U.S. Patent No. 4,689,110).

Leibowitz discloses a laminate with alternating layers of PTFE material and graphite impregnated with an epoxy resin (column 2, lines 30-48). The high coefficient of expansion of the PTFE is controlled by the graphite layers (column 4, lines 40-65). Kashima et al. disclose a laminate of fabrics composed of glass fibers and/or polyethylene fibers (column 7, lines 14-64). Each fabric layer may be composed of the same material, alternating the positive coefficient fibers with the negative coefficient fibers, or each fabric may be composed of two different fibers. The fabric layers are then impregnated with an epoxy resin. With regard to claims 31 and 32, the limitation that the composite material is fully balanced is not limiting the claim any further because the claim does not recite what the composite is being balanced to. Applicant recites in the specification that the coefficient can be controlled to zero or any predetermined value (page 7). The composite of Leibowitz must be balanced to some predetermined value.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 3, 7, 22, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leibowitz in view of Yuan (U.S. Patent No. 4,020,209).

Leibowitz does not disclose the fabrics to be woven in a triaxial configuration. Yuan teaches that triaxial fabric can be used to create a range of designs and parameters of strength, density, weight, and porosity (column 2, lines 37-61) and that triaxial fabric is used in preparing circuit boards (column 4, lines 6-7). It would have been obvious to one having ordinary skill in the art to use a triaxial weave in the fabrics of Leibowitz in order to create the fabrics with a wide range of designs and parameters, as taught by Yuan.

11. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyadera et al. in view of Leibowitz.

Miyadera et al. do not teach using carbon or polyparaphenylene benzo oxazale fibers as the fibers with a negative coefficient of expansion. Leibowitz teaches that the use of graphite fibers greatly strengthens the circuit board structure (column 5, lines 11-13). It would have been obvious to one having ordinary skill in the art to use graphite fibers as the fibers with a negative coefficient of expansion in the laminate of Miyadera et al. in order to increase the strength of the laminate, as taught by Leibowitz.

Response to Arguments

12. Applicant's arguments filed on September 5, 2003 have been fully considered but they are not persuasive.

13. Applicant argues that the objection to claim 23 should be withdrawn because claim 23 "is more specific in that indicates that this is accomplished by providing

'different sheets of reinforcing fibers' having different coefficients of linear expansion." However, the claim language does not support Applicant's interpretation. Applicant argues that the fibers are the material having different coefficients of linear expansion. But the claim recites "wherein different sheets of reinforcing fibers have different coefficients of linear expansion." This language claims that the sheets have different coefficients of linear expansion, not the fibers. This limitation is already found in claim 4, so the objection to claim 23 is maintained.

14. Applicant argues that the claims are definite because the fiber reinforced composite material according to the present invention has a reduced or low coefficient of thermal expansion regardless of what it is compared to among such composites in the prior art. This argument still does not define a scope for the claims, because the art is littered with composites such as this that teach using low coefficients of thermal expansion, zero coefficients of thermal expansion, and negative coefficients of thermal expansion. There is no consensus in the art on coefficients of thermal expansion. Applicant's claims do not define a definite scope. What does it mean to be compared to "such composites in the prior art?" Does it mean articles using exactly the same or similar materials? Articles used for similar purposes? What types of composites are in the same art and what type of composites are not?

15. Applicant argues that the coefficient of thermal expansion of the matrix resin is not counterbalanced by the coefficient of thermal expansion of the reinforcing fibers in the Miyadera, Kashima, and Leibowitz references. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that

the features upon which applicant relies (i.e., coefficient of thermal expansion for the matrix resin) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

16. Applicant argues that the prior art does not teach how to correlate that which is taught by Yuan with the objective of Leibowitz. However, Yuan discloses the advantages of weaving in a triaxial configuration and Leibowitz teaches weaving the fabrics. A person of ordinary skill in the art would be able to weave the material of Leibowitz in a triaxial configuration to derive the advantages taught by Yuan, as set forth above.

17. Applicant argues that substituting graphite fibers in Miyadera would be to fly in the face of Miyadera and do what Miyadera suggest would be unacceptable. However, the Examiner maintains that substitution of graphite for polyamide fibers would offer increased strength, as set forth above in the rejection. Applicant does not point out where Miyadera suggests that graphite fibers are unacceptable for that invention, and the Examiner cannot find such a suggestion in the reference.

Conclusion

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy R. Pierce whose telephone number is (703) 605-4243. The examiner can normally be reached on Monday-Thursday 7-4:30 and alternate Fridays 7-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (703) 308-2414. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

jrp

ELIZABETH M. COLE
PRIMARY EXAMINER